

NOTE ON *ARIUNCULUS AUSTRIACUS*, n.sp., FROM THE ALPS IN AUSTRIA.

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*ARIUNCULUS AUSTRIACUS*, n.sp.

Animal thick and short, obtusely pointed behind, of the form and size of *Ariunculus Isselii*, Bgt.; shield gibbose, minutely granulose; back finely rugose, the rugæ on the sides wide, depressed. Colour of the head-shield and back, dark brown, whilst the sides in the anterior portion of the body and the neck are light yellow, without bands or spots. Margin of foot reddish, but blackish posteriorly, transversely sulcate, and striped with brown, the stripes being alternately strong and faint (thus exactly resembling the foot-margin of *Arion empiricorum*, var. *marginatus*). Caudal gland well defined, triangular, fairly deep, surrounded by the dilated foot-margin. Genital orifice placed between the respiratory orifice (which is situated towards the anterior end of the shield) and the right tentacle. Foot-sole whitish, with greyish lateral zones. No shell present. Length (in alcohol) 32 mm.<sup>1</sup>

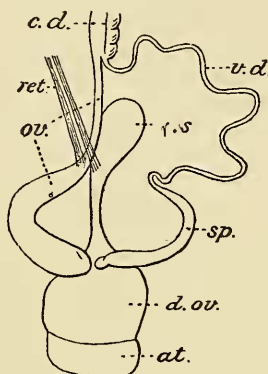
*Hab.* — Schneeberg, near Vienna (coll. Dr. A. Wagner). One specimen is in the collection of the K. K. Naturhistorisches Hofmuseum: no locality is given, but it probably comes from the Alps in the neighbourhood of Vienna.

*Anatomy.* — The pallial complex resembles that of *Arion* (the nephridium is horseshoe-shaped), to which genus there is besides a complete similarity in the form and arrangement of all the digestive organs (the jaw may be accounted aulacognath; the radula has not been examined) and of the nervous system. The retractors of the tentacles are symmetrical. The pedal gland is also like that in *Arion*. By the agency of the blood-vessels small calcareous concretions are formed.

*Genitalia.* — The hermaphrodite gland is deeply pigmented, pyriform, divided into two parts by the genital artery, small (in the second example very large). The hermaphrodite duct is long, thin, undulating, and without any diverticulum at the end. The albumen gland is voluminous, long, and tongue-shaped. The convolute common duct (*c.d.*) has numerous folds; the prostate portion is of a violet colour, the oviduct being white. The vas deferens (*v.d.*) is relatively long, the sperm duct (*Patronenstrecke*) (*sp.*) distinct, rather thick and cylindrical, having a globular termination, the inner surface of which is studded with copulatory papillæ. The receptaculum

<sup>1</sup> This new species, like *Ariunculus Isselii* (Simroth [3], p. 331), quite gives one the impression, at first sight, of being a dwarfed form of *Arion empiricorum*.

seminis (*r.s.*) possesses a spherical ampulla, its duct is thin and short, swelling out below till it assumes the shape of an inverted funnel at the point where it joins the dilated portion of the oviduct (*d.ov.*). The free portion of the oviduct (*ov.*) is very long, curved somewhat in the shape of an S, and furnished with internal folds. Its upper moiety is thin, narrow, and straight, but after the point of attachment of the retractor muscle it becomes stouter and increases perceptibly in size. All three ducts (male, female, and receptacular) enter a large rounded expansion<sup>1</sup> of the free oviduct (*d.ov.*), generally



Portion of the reproductive organs of *Ariunculus Austriacus*, n.sp.

*at.* atrium; *c.d.* common duct; *d.ov.* dilated portion of the oviduct; *ov.* free portion of oviduct; *r.s.* receptaculum seminis; *ret.* retractor muscles; *sp.* sperm duct; *v.d.* vas deferens.

but wrongly designated the 'upper atrium.' On laying open this structure the female copulatory lingula may be observed, coiled on itself in three folds, just as it is in *Arion Lusitanicus*.

Beyond the attachment of the retractor muscle (*ret.*) to the oviduct, and close to the point at which it is given off, a muscle passes to the stalk of the receptaculum seminis. It is a fact of some importance that the genital retractor muscle is shown by its remarkable breadth to consist of two separate muscle bands incompletely fused (another instance of paired genital retractors in a species of *Arion* has been cited by Collinge [6]). Its point of origin is posterior to the edge of the mantle. The atrium (*at.*)—generally called the 'lower atrium'—is distinctly glandular and folded inwards. There is no pigmentation of the terminal ducts.

The anatomy of the present species, when compared with that of other representatives of the genus, agrees most nearly with that of the

<sup>1</sup> This expansion was of enormous extent in the second of the two examples under observation, a condition which is well known to prevail when the animal is in its male phase.

Sardinian section *Ichnusarion*, Poll.; there is but slight difference in the sexual apparatus between *A. Isselii*, Bgt., and *A. Austriacus*, nevertheless its external characters and its habitat show the latter to be distinct. Were the structure of adult individuals of *Ariunculus*, Less. (Poll.), s.str., known (half-grown animals of *Ariunculus Mortilleti*, Less., were, it is true, dissected by Simroth [3]), better reasons for this contention would undoubtedly be forthcoming.

Our knowledge (small enough, certainly) of the anatomy of this group of Palearctic Arionidæ (founded on the descriptions of *Ariunculus* furnished by Lessona [1], Pollonera [4], and Simroth [3], and of *Letourneuxia* by Hesse [2], Pollonera [4], and Simroth [5]), tends to confirm the opinion of Simroth [5] that Pollonera [3] was wrong in assigning *Letourneuxia*, Bgt., to the genus *Geomalacus*, Allm., when it is manifestly much more nearly allied to *Ariunculus*, while *Geomalacus* stands apart amongst the Arionidæ.

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[See also these Proceedings, ante, p. 94, PILSBRY, H. A., "Phylogeny of the Genera of Arionidæ."]